



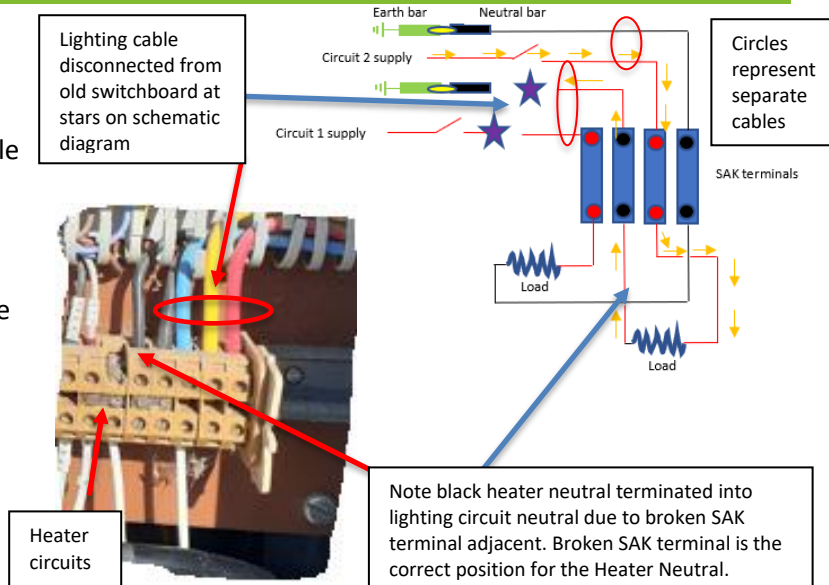
Crossed neutral livens disconnected cable

WHAT HAPPENED?

An outdoor substation lighting cable was identified, tested dead and removed from the old switchboard to be re-routed to a newly installed switchboard. The load end of the cable had previously been wired into an outdoor junction box with other circuits fed from different supplies.

Previous work within the ODJB had crossed the neutrals over on the heater and lighting circuits.

During the re-routing of the lighting cable the disconnected cable was retested and found 230v present on the neutral. See ODJB photograph and schematic adjacent.



IMMEDIATE ACTION TAKEN

- Checked for voltage and traced to source. Found crossed neutral wiring in the ODJB.
- Corrected wiring errors and reported incident.

ROOT CAUSE

- Previous poor wiring practice and lack of testing/checks is the primary root cause of this incident.
- Pulling fuses and testing for voltage will not pick up a crossed neutral. Once the neutral is disconnected from the neutral bar or broken, full voltage becomes present on a return wire if neutrals are crossed.
- Crossed neutrals mix circuit returns. Some cables may be under rated for another circuits return current, creating a possible fire hazard.

LEARNINGS

- Crossed neutrals are not detectable by just testing after removing of a fuse.
- Retesting cables after being fully disconnected from the source is advisable.
- Testing and certification of all wiring is mandatory as per AS/NZS3000 regulations. This will pick up any wiring errors if conducted correctly at the completion of a job.
- Crossed neutrals mix circuits that may cause conductor overloading, lethal electrical situations during maintenance or use of equipment.

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